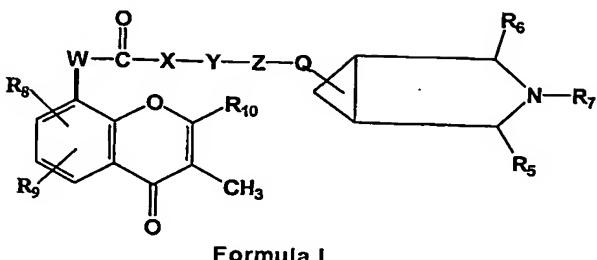


## WE CLAIM:

1. A compound having the structure of Formula I:



and its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters, enantiomers, diastereomers, N-oxides, polymorphs, metabolites wherein

W represents  $(CH_2)_p$ , where p represents 0 to 1;

10 X represents an oxygen, sulphur, -NR or no atom wherein R represents hydrogen or  $C_{1-6}$  alkyl;

Y represents  $CHR_1CO$ , wherein  $R_1$  represents hydrogen or methyl or  $(CH_2)_q$  wherein q represents 0 to 4;

Z represents oxygen, sulphur, NR<sub>2</sub>, wherein R<sub>2</sub> represents hydrogen, or  $C_{1-6}$  alkyl;

15 Q represents  $(CH_2)_n$  wherein n represents 0 to 4, or  $CHR_3$  wherein  $R_3$  represents H, OH,  $C_{1-6}$  alkyl,  $C_{1-6}$  alkenyl  $C_{1-6}$  alkoxy or  $CH_2CHR_4$  wherein  $R_4$  represents H, OH, lower alkyl ( $C_1-C_4$ ) or lower alkoxy ( $C_1-C_4$ );

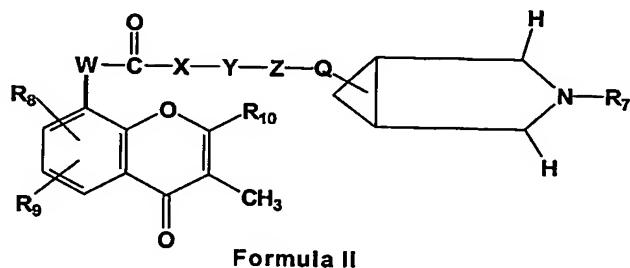
$R_5$  and  $R_6$  are independently selected from COOH, H, CH<sub>3</sub>, CONH<sub>2</sub>, NH<sub>2</sub>, CH<sub>2</sub>NH<sub>2</sub>;

20 R<sub>7</sub> represents hydrogen,  $C_{1-C_{15}}$  saturated or unsaturated aliphatic hydrocarbon groups in which any 1 to 6 hydrogen atoms may be substituted with the group independently selected from halogen, arylalkyl, arylalkenyl, heteroarylalkyl or heteroarylalkenyl having 1 to 2 hetero atoms selected from a group consisting of nitrogen, oxygen and sulphur atoms with option that any 1 to 3 hydrogen atoms on an aryl or heteroaryl ring in said arylalkyl, arylalkenyl, hetero arylalkenyl group may be substituted with lower alkyl ( $C_1-C_4$ ), lower perhalo alkyl ( $C_1-C_4$ ), cyano, hydroxyl, nitro, lower alkoxy carbonyl, halogen, lower alkoxy ( $C_1-C_4$ ), lower perhaloalkoxy ( $C_1-C_4$ ); unsubstituted amino, N-lower alkylamino ( $C_1-C_4$ ), N-lower alkylamino carbonyl ( $C_1-C_4$ ), N,N-lower dialkylamino ( $C_1-C_4$ ), N,N-lower dialkylaminocarbonyl;

R<sub>8</sub> and R<sub>9</sub> are independently selected from the group consisting of hydrogen, lower alkyl (C<sub>1</sub>-C<sub>4</sub>), trifluoromethyl, cyano, hydroxy, nitro, lower alkoxy (C<sub>1</sub>-C<sub>4</sub>), amino or lower alkylamino; and

R<sub>10</sub> represents aryl which may be substituted with one or more substituent.

5 2. The compound according to claim 1 having the structure of Formula II and its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters, enantiomers, diastereomers, N-oxides, polymorphs, metabolites wherein R<sub>8</sub>, R<sub>9</sub>, R<sub>10</sub>, R<sub>7</sub>, W, X, Y, Z, Q are the same as defined for Formula I



(Formula I, wherein R<sub>5</sub>=R<sub>6</sub>=H)

3. A compound selected from the group consisting of:

15 (1 $\alpha$ , 5 $\alpha$ , 6 $\alpha$ )-6N-[3-benzyl-3-azabicyclo[3.1.0]hexyl]-3-methyl-4-oxo- $\alpha$ -phenyl-4H-1-benzopyran-8-carboxamide (Compound No. 1)

(1 $\alpha$ , 5 $\alpha$ , 6 $\alpha$ )-6N-[3-(4-cyanobenzyl)-3-azabicyclo[3.1.0]hexyl]-3-methyl-4-oxo-2-phenyl-4H-1-benzopyran-8-carboxamide (Compound No. 2)

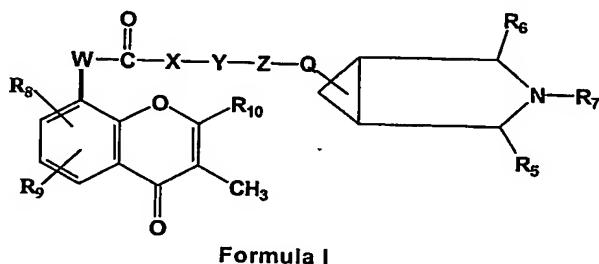
20 (1 $\alpha$ ,5 $\alpha$ , 6 $\alpha$ )-N-[3-benzyl-3-azabicyclo [3.1.0] hexyl-6-(aminomethyl)-yl]-3-methyl-4-oxo-2-phenyl-4H-1-benzopyran-8-carboxamide (Compound No. 3)

(1 $\alpha$ ,5 $\alpha$ ,6 $\alpha$ )-N-[3-(4-methyl-3-pentyl)-3-azabicyclo[3.1.0]hexyl-6-(aminomethyl)-yl]-3-methyl-4-oxo-2-phenyl-4H-1-benzopyran-8-carboxamide (Compound No. 4)

N-[3-benzyl-3-azabicyclo[3.1.0]hexyl-1-(aminomethyl)-yl]-3-methyl-4-oxo-2-phenyl-4H-1-benzopyran-8-carboxamide (Compound No. 5)

4. A pharmaceutical composition comprising a pharmaceutically effective amount of a compound as defined in claim 1, 2 or 3 together with pharmaceutically acceptable carriers, excipients, or diluents.

5. A method for treatment or prophylaxis of an animal or a human suffering from a disease or disorder of the respiratory, urinary and gastrointestinal systems, wherein the disease or disorder is mediated through the muscarinic receptors, comprising administering to said animal or human, a therapeutically effective amount of a compound having the structure of Formula I,



or its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters, enantiomers, diastereomers, N-oxides, metabolites, wherein:

15

W represents  $(CH_2)_p$ , where p represents 0 to 1;

X represents an oxygen, sulphur, -NR or no atom wherein R represents hydrogen or C<sub>1-6</sub> alkyl;

20

Y represents CHR<sub>1</sub>CO, wherein R<sub>1</sub> represents hydrogen or methyl or  $(CH_2)_q$  wherein q represents 0 to 4;

Z represents oxygen, sulphur, NR<sub>2</sub>, wherein R<sub>2</sub> represents hydrogen, or C<sub>1-6</sub> alkyl;

Q represents  $(CH_2)_n$  wherein n represents 0 to 4, or CHR<sub>3</sub> wherein R<sub>3</sub> represents H, OH, C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkenyl, C<sub>1-6</sub> alkoxy or CH<sub>2</sub>CHR<sub>4</sub> wherein R<sub>4</sub> represents H, OH, lower alkyl (C<sub>1-C4</sub>) or lower alkoxy (C<sub>1-C4</sub>);

25

R<sub>5</sub> and R<sub>6</sub> are independently selected from COOH, H, CH<sub>3</sub>, CONH<sub>2</sub>, NH<sub>2</sub>, CH<sub>2</sub>NH<sub>2</sub>;

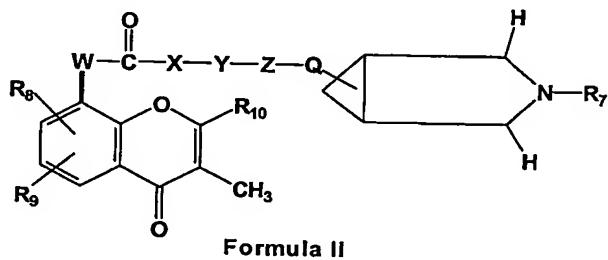
R<sub>7</sub> represents hydrogen, C<sub>1-C15</sub> saturated or unsaturated aliphatic hydrocarbon groups in which any 1 to 6 hydrogen atoms may be substituted with the group independently selected from halogen, arylalkyl, arylalkenyl, heteroarylalkyl or heteroarylalkenyl having 1 to 2 hetero atoms selected from a group consisting of

nitrogen, oxygen and sulphur atoms with option that any 1 to 3 hydrogen atoms on an aryl or heteroaryl ring in said arylalkyl, arylalkenyl, hetero arylalkenyl group may be substituted with lower alkyl (C<sub>1</sub>-C<sub>4</sub>), lower perhalo alkyl (C<sub>1</sub>-C<sub>4</sub>), cyano, hydroxyl, nitro, lower alkoxy carbonyl, halogen, lower alkoxy (C<sub>1</sub>-C<sub>4</sub>), lower perhaloalkoxy (C<sub>1</sub>-C<sub>4</sub>); unsubstituent amino, N-lower alkylamino (C<sub>1</sub>-C<sub>4</sub>), N-lower alkylamino carbonyl (C<sub>1</sub>-C<sub>4</sub>), N,N-lower dialkylamino (C<sub>1</sub>-C<sub>4</sub>), N,N-lower alkylaminocarbonyl;

R<sub>8</sub> and R<sub>9</sub> are independently selected from lower alkyl (C<sub>1</sub>-C<sub>4</sub>), trifluoromethyl, cyano, hydroxy, nitro, lower alkoxy (C<sub>1</sub>-C<sub>4</sub>), amino or lower alkylamino; and

10 R<sub>10</sub> represents aryl which may be substituted with one or more substituent.

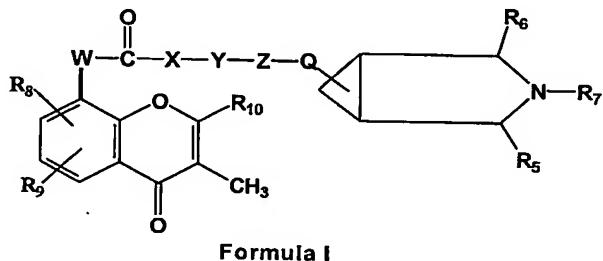
6. The method according to claim 5 for treatment or prophylaxis of an animal or a human suffering from a disease or disorder of the respiratory, urinary and gastrointestinal systems, wherein the disease or disorder is mediated through the muscarinic receptors, comprising administering to said animal or human, a therapeutically effective amount of a compound having the structure of Formula II, and its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters, enantiomers, diastereomers, polymorphs, or metabolites, wherein R<sub>8</sub>, R<sub>9</sub>, R<sub>10</sub>, R<sub>7</sub>, W,X,Y,Z,Q are as defined for Formula I.



(Formula I, wherein R<sub>5</sub>=R<sub>6</sub>=H)

7. The method according to claim 5 wherein the disease or disorder is urinary incontinence, lower urinary tract symptoms (LUTS), bronchial asthma, chronic obstructive pulmonary disorders (COPD), pulmonary fibrosis, irritable bowel syndrome, obesity, diabetes, and gastrointestinal hyperkinesis.

8. The method according to claim 6 wherein the disease or disorder is urinary incontinence, lower urinary tract symptoms (LUTS), bronchial asthma, chronic obstructive pulmonary disorders (COPD), pulmonary fibrosis, irritable bowel syndrome, obesity, diabetes, and gastrointestinal hyperkinesis.
- 5 9. The method for treatment or prophylaxis of an animal or a human suffering from a disease or disorder of the respiratory, urinary, and gastrointestinal systems, wherein the disease or disorder is mediated through the muscarinic receptors, comprising administering to said animal or human, a therapeutically effective amount of the pharmaceutical composition according to claim 4.
- 10 10. The method according to claim 9 wherein the disease or disorder is urinary incontinence, lower urinary tract symptoms (LUTS), bronchial asthma, chronic obstructive pulmonary disorders (COPD), pulmonary fibrosis, irritable bowel syndrome, obesity, diabetes, and gastrointestinal hyperkineses.
11. A process of preparing a compound of formula I,



20 and its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters, enantiomers, diastereomers, N-oxides, polymorphs, metabolites, wherein W represents  $(CH_2)_p$ , where p represents 0 to 1;  
X represents an oxygen, sulphur, -NH or no atom wherin R represents hydrogen or C<sub>1-6</sub> alkyl;  
Y represents, CHR<sub>1</sub>CO wherein R<sub>1</sub> represents hydrogen or methyl or  $(CH_2)_q$  wherein q represents 0 to 4;  
25 Z represents oxygen, sulfur, NR<sub>2</sub>, wherein R<sub>2</sub> represents hydrogen, or C<sub>1-6</sub> alkyl;

Q represents  $(CH_2)_n$  wherein n represents 0 to 4, or  $CHR_3$  wherein  $R_3$  represents H, OH,  $C_{1-6}$  alkyl,  $C_{1-6}$  alkenyl,  $C_{1-6}$  alkoxy or  $CH_2CHR_4$  wherein  $R_4$  represents H, OH, lower alkyl ( $C_1-C_4$ ) or lower alkoxy ( $C_1-C_4$ ); or lower alkoxy ( $C_1-C_4$ );

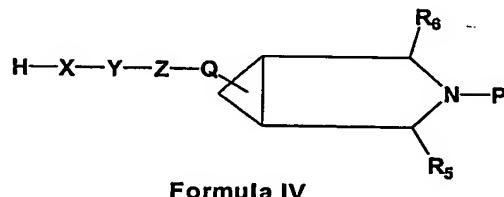
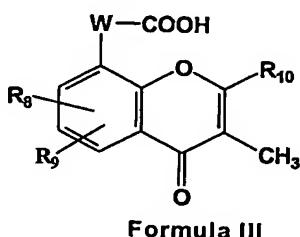
5  $R_5$  and  $R_6$  are independently selected from COOH, H,  $CH_3$ ,  $CONH_2$ ,  $NH_2$ ,  $CH_2NH_2$ ;

10  $R_7$  represents hydrogen,  $C_{1-C_{15}}$  saturated or unsaturated aliphatic hydrocarbon groups in which any 1 to 6 hydrogen atoms may be substituted with the group independently selected from halogen, arylalkyl, arylalkenyl, heteroarylalkyl or heteroarylalkenyl having 1 to 2 hetero atoms selected from a group consisting of nitrogen, oxygen and sulphur atoms with option that any 1 to 3 hydrogen atoms on an aryl or heteroaryl ring in said arylalkyl, arylalkenyl, hetero arylalkenyl group may be substituted with lower alkyl ( $C_1-C_4$ ), lower perhalo alkyl ( $C_1-C_4$ ), cyano, hydroxyl, nitro, lower alkoxy carbonyl, halogen, lower alkoxy ( $C_1-C_4$ ), lower perhaloalkoxy ( $C_1-C_4$ ); unsubstituted amino, N-lower alkylamino ( $C_1-C_4$ ), 15 N-lower alkylamino carbonyl ( $C_1-C_4$ ), N,N-lower dialkylamino ( $C_1-C_4$ ), N,N-lower alkylaminocarbonyl;

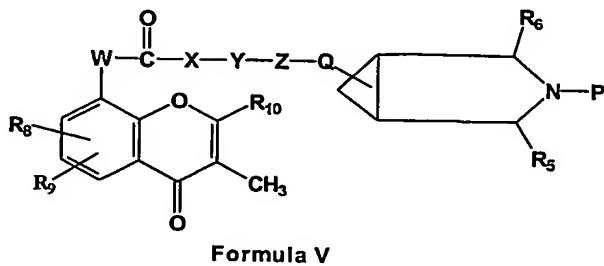
$R_8$  and  $R_9$  are independently selected from lower alkyl ( $C_1-C_4$ ), trifluoromethyl, cyano, hydroxy, nitro, lower alkoxy ( $C_1-C_4$ ), amino or lower alkylamino; and

20  $R_{10}$  represents aryl which may be substituted with one or more substituent, comprising

a) condensing a compound of Formula III with a compound of Formula IV

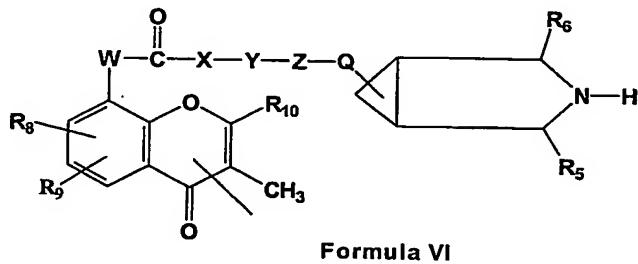


wherein W,X,Y,Z, Q, R<sub>10</sub>, R<sub>7</sub>, R<sub>6</sub>, R<sub>9</sub>, R<sub>8</sub> have the same meanings as defined earlier for Formula I, to give a protected compound of Formula V wherein P is a protecting group for an amino group,



10

b) deprotecting the compound of Formula V in the presence of a deprotecting agent to give an unprotected intermediate of Formula VI wherein R<sub>5</sub>, R<sub>6</sub>, R<sub>8</sub>, R<sub>9</sub>, R<sub>10</sub>, W, X, Y, Z, Q are the same as defined earlier, and



15

c) the intermediate of Formula VI is N-alkylated or benzylated with a suitable alkylating or benzylating agent to give a compound of Formula I wherein R<sub>8</sub>, R<sub>9</sub>, R<sub>10</sub>, R<sub>7</sub>, R<sub>5</sub>, W, X, Y, Z, Q are the same as defined earlier.

20

12. The process according to claim 11 wherein P is any protecting group for an amino group and is selected from the group consisting of benzyloxy and t-butyloxy carbonyl groups.

25

13. The process according to claim 11 wherein the reaction of a compound of Formula III with a compound of Formula IV to give a compound of Formula V is carried out in the presence of a condensing agent which is selected from the group consisting of 1-(3-dimethylamino propyl)-3-ethyl carbodiimide hydrochloride (EDC) and 1,8-diazabicyclo [5.4.0]undec-7-ene (DBU).

14. The process according to claim 11 wherein the reaction of a compound of Formula III with a compound of Formula IV to give a compound of Formula V is carried out in the presence of a suitable solvent selected from the group consisting of N,N-dimethylformamide, dimethylsulphoxide, toluene and xylene.

5 15. The process according to claim 11 wherein the reaction of a compound of Formula III with a compound of Formula IV is carried out at temperature ranging from about 0-140°C.

10 16. The process according to claim 11 wherein the deprotection of a compound of Formula V to give a compound of Formula VI is carried out with a deprotecting agent which is selected from the group consisting of palladium on carbon, trifluoroacetic acid and hydrochloric acid.

15 17. The process according to claim 11 wherein the deprotection of a compound of Formula V to give a compound of Formula VI is carried out in a suitable solvent selected from the group consisting of methanol, ethanol, tetrahydrofuran, and acetonitrile.

18. The process according to claim 11 wherein the N alkylation or benzylation of a compound of Formula VI to give a compound of Formula I is carried out with a suitable alkylating or benzylating agent, L-R<sub>7</sub>, wherein L is any leaving group and R<sub>7</sub> is the same as defined earlier.